

## NEW SPECIES OF *SONORELLA* (PULMONATA: HELMINTHOGLYPTIDAE) FROM NEW MEXICO AND TEXAS

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### ABSTRACT

*Two new species of land snails of the genus Sonorella (metcalfi and todseni) are described from Doña Ana County, New Mexico, and El Paso County, Texas.*

*Sonorella orientis* Pilsbry, 1936, was first collected in 1897 by C. H. T. Townsend in Fillmore Canyon, Organ Mountains, Doña Ana County, New Mexico, as stated by Pilsbry and Ferriss (1905). The type lot, including live snails, was collected by Ferriss and Pilsbry in 1922, at Dripping Springs in Ice Canyon, Organ Mountains, just south of Fillmore Canyon, and was described as a subspecies of *Sonorella hachitana* (Dall, 1895) by Pillsbry (1936). I collected it in Fillmore Canyon on 7 June 1965, but was unable to obtain live specimens for dissection. Subsequently, Artie L. Metcalf, of the University of Texas at El Paso, sent me live specimens from several localities in Fillmore Canyon, Ice Canyon, and Rock Springs Canyon. Dissection of several series of specimens revealed that the reproductive anatomy differed significantly from that of *S. hachitana*. This information, plus evidence obtained in my laboratory (unpublished hybridizing experiments) that *S. hachitana* is apparently an obligate calcicole, with peculiar nutritional or growth factor requirements, were considered sufficient to infer probable reproductive isolation and accordingly, Bequaert and Miller (1973) raised *S. orientis* to specific rank.

Since 1967, Artie Metcalf and Thomas Todsén have continued to collect in the Organ Mountains, as well as in the San Andres Mountains to the north, the Doña Ana Mountains to the west, and the Franklin Mountains to the south. They have kindly sent me many specimens from their collections. Examination of shell characteristics as well as reproductive anatomy of the collected specimens reveals the presence of two new species of *Sonorella*, one in the Franklin Mountains and one in the Doña Ana Mountains. I take great pleasure in naming these new species after their discoverers, Dr.

Artie L. Metcalf of the Department of Biological Sciences, University of Texas at El Paso, and Dr. Thomas K. Todsén, of the White Sands Missile Range, New Mexico. I also wish to thank the Commander, White Sands Missile Range, and his staff for permitting this scientific exploration of the San Andres Mountains.

### *Sonorella metcalfi* new species

Figs. 1 and 4

*Description of holotype.* Shell depressed-globose, heliciform, thin, glossy, light tan, with chestnut spiral band on the well-rounded shoulder; umbilicate, the umbilicus contained 10 times in the diameter and about ¼th covered by the reflected columellar lip. Embryonic shell of 1½

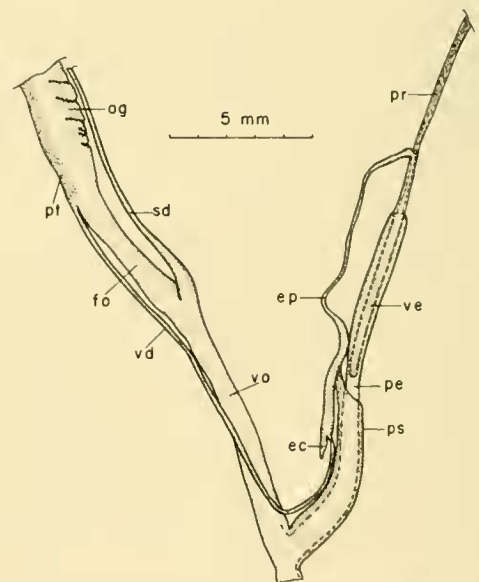


FIG. 1. *Sonorella metcalfi*, new species, W. B. Miller. Distal reproductive structures. Drawing made from stained whole mount. Abbreviations: ec epiphallial caecum; ep epiphallus; fo free oviduct; og oviducal gland; pe penis; pr penial retractor; ps penial sheath; pt prostate; sd spermathecal duct, va vagina; vd vas deferens; ve verge.

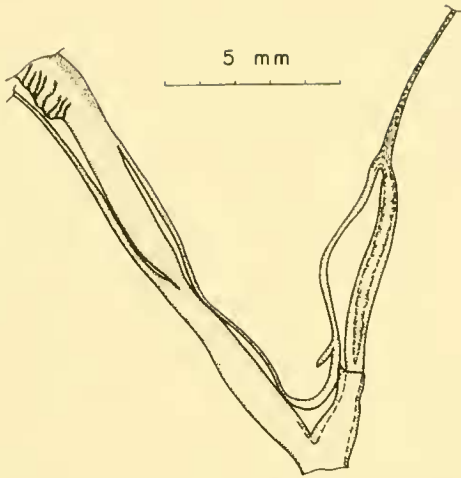


FIG. 2. *Sonorella todseni*, new species, W. B. Miller. Distal reproductive structures. Drawing made from stained whole mount.

whorls, silky-smooth, not glossy, with light, radial ripples and traces of descending, spiral threads above the suture, visible at about 10 $\times$  to 20 $\times$  magnification. Post-embryonic whorls marked with light growth wrinkles. Last fourth of body whorl with light, incised spiral lines, most pronounced near shoulder. The periostracum has a silky, lustrous appearance. The last whorl descends abruptly to the slightly expanded peristome. Aperture oblique, rounded, slightly wider than high, with margins converging; parietal callus thin. Shell measurements, in mm: diameter 19.8, height 12.0, umbilicus 2.0, 4 $\frac{1}{4}$  whorls.

*Reproductive anatomy.* The ovotestes, hermaphroditic duct, seminal vesicle, albumen gland, spermoviduct, spermatheca, and spermathecal duct are typical of the genus. The penis contains a long, thin cylindrical verge bluntly rounded at its tip; the verge is slightly less than half as long as the penis. A penial sheath covers the distal half of the penis. Epiphallus very thin distally, the distal end embedded in the penial retractor muscle, then enlarging proximally to its junction with the vas deferens and the short, free, epiphallal caecum. Vagina about  $\frac{3}{4}$ th the length of the penis. Lengths, in mm, as follows: Penis 13; penial sheath 6.5; verge 6; epiphallus 14; epiphallal caecum 0.8; vagina 10.

*Type Locality.* North Franklin Mountain, El

Paso Co., Texas, in a northwest arm of Fusselman Canyon, above spring. Latitude 31° 53.7' N, longitude 106° 29.0' W; elevation ca 5300 feet. Collector: Artie L. Metcalf, 11 May 1972.

*Type Material.* Holotype, United States National Museum No. 760816. Paratypes: Delaware Museum of Natural History, No. 99172; Academy of Natural Sciences of Philadelphia, No. 338227; Museum of Arid Land Biology, U. T. El Paso, No. 4374, and the author, No. 5938.

*Distribution.* *Sonorella metcalfi* is found in the Franklin Mountains of Texas and in the southernmost part of the Organ Mountains of New Mexico. It has been collected at the following localities: Franklin Mountains: (1) Several localities in Fusselman Canyon, (2) Tom Mays Park, 0.2 mi SW of West Cottonwood Spring, (3) West slope of South Franklin Mountain, at ca 5500 feet. Organ Mountains: head of Finley Canyon at ca 6000 feet. All collections by Artie L. Metcalf.

#### *Sonorella todseni* new species

Figs. 2 and 4

*Description of holotype.* Shell depressed-globose, heliciform, thin, glossy, light tan, with narrow, chestnut spiral band on the well-rounded shoulder; umbilicate, the umbilicus contained 7 times in the diameter and only slightly covered by the reflected columellar lip. Embryonic shell of 1 $\frac{1}{2}$  whorls, dull with minute radial ripples on which are superimposed many spirally descending and ascending interrupted threads and granules. Postembryonic whorls marked with light growth wrinkles and granules, the granules becoming absent on the body whorl. The periostracum has a silky, lustrous appearance. The last whorl descends abruptly to the slightly expanded peristome. Aperture oblique, rounded, slightly wider than high, with margins converging; parietal callus very thin. Shell measurements, in mm: diameter 17.9, height 9.6, umbilicus diameter 2.6; 4 $\frac{1}{4}$  whorls.

*Reproductive anatomy.* Ovotestes and proximal accessory structures as in other *Sonorella*. The penis contains a long, thin, unevenly corrugated verge tapering to a pointed tip; the

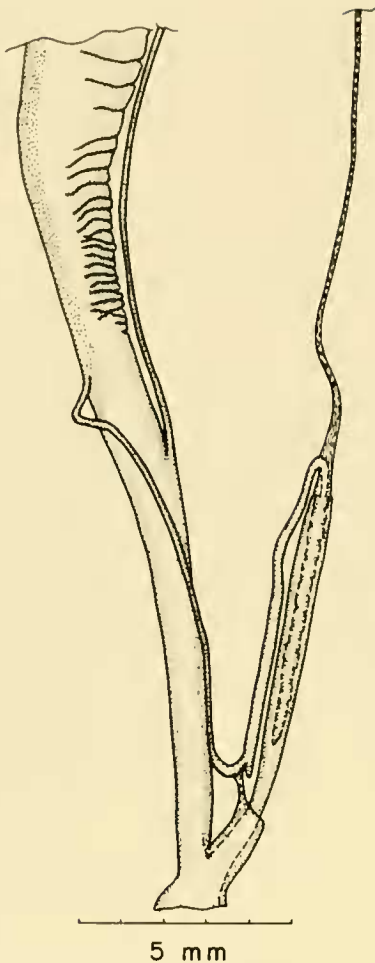


FIG. 3. *Sonorella orientis* Pilsbry. Distal reproductive structures. Drawing made from stained whole mount.

verge is about  $\frac{2}{3}$  the length of the penis. A penial sheath envelops the distal third of the penis. Epiphallus thin, the distal part embedded in the penial retractor muscle; a very short, free, epiphallic caecum is present. Vagina about  $\frac{3}{4}$  the length of the penis. Lengths in mm, as follows: penis 8, penial sheath 2.5, verge 5.5, epiphallus 6.5, epiphallic caecum 0.7; vagina 6.

*Type Locality.* Doña Ana Mountains, Doña Ana Co., New Mexico, on NW slope of Doña Ana Peak (NW  $\frac{1}{4}$ , SW  $\frac{1}{4}$ , NE  $\frac{1}{4}$ , Sec. 25, T 21 S, R 1 E); elevation ca 5300 feet. Collector: Artie L. Metcalf, 28 August 1972.

*Type Material.* Holotype, United States National Museum No. 760817. Paratypes: Delaware Museum of Natural History, No. 99171; Academy of Natural Sciences of Philadelphia,

No. 338228; Museum of Arid Land Biology, U. T. El Paso No. 2809; private collection of the author, No. 5973.

*Distribution.* *Sonorella todseni* is known only from the Doña Ana Mountains of New Mexico, a small, detached outlier of the Organ Mountains, just north of Las Cruces. It was originally collected on 1 October 1967 by Dr. Thomas L. Todsens (ALM #850; WBM #5023), a small lot of shells only. Subsequently, a lot containing one live adult was collected by Edward Stern and Artie Metcalf on 23 January 1969 (WBM #5103). The type lot, consisting of many live adults as well as shells only, was collected by Artie Metcalf on 28 August 1972.

*Remarks.* Compared to *S. metcalfi*, *S. todseni* has a generally smaller, lower, more widely umbilicate shell, with the umbilicus less covered by the reflected columellar lip. Fresh shells tend to show heavier granulation under high magnification. It is in the anatomy that differences are more easily discerned. *S. todseni* has a coarsely corrugated verge, tapering to a



FIG. 4. Top row, *Sonorella todseni*, new species, W. B. Miller. Middle row, *Sonorella metcalfi*, new species, W. B. Miller. Bottom row, *Sonorella orientis* Pilsbry.

pointed tip; the walls of the penial chamber surrounding the verge are relatively smooth. *S. metcalfi* has a nearly smooth, cylindrical verge, bluntly rounded at its tip; the walls of the penial chamber surrounding the verge are thickened, glandular, and finely corrugated. Although dimensions of anatomical structures show much variability, certain length ratios, such as verge/penis (ve/p), vagina/penis (va/p), and penial sheath/penis (ps/p) appear to be consistent and diagnostically useful. Approximate values of these ratios are: *S. todseni*, ve/p  $\frac{2}{3}$ , va/p  $\frac{3}{4}$ , and ps/p  $\frac{1}{4}$ ; *S. metcalfi*, ve/p  $\frac{1}{2}$ , va/p  $\frac{3}{4}$ , and ps/p  $\frac{1}{2}$ .

Both *S. metcalfi* and *S. todseni* appear to be closely related to *S. orientis* Pilsbry 1936, and all three species probably speciated relatively recently from a common ancestral population. *S. orientis* (Figs. 3 & 4) has a usually larger, widely umbilicate shell. It has a long, coarsely corrugated, tapering verge, in a smooth-walled, capacious penial chamber with ve/p *ca*  $\frac{2}{3}$ , va/p *ca* 1 or  $>1$ , and ps/p *ca*  $\frac{1}{5}$ . *S. orientis* is found throughout the Organ Mountains except perhaps the southernmost part (Finley Canyon) where *S.*

*metcalfi* is found; the possibility of their being sympatric there needs to be confirmed by additional collecting and dissection. It is also found in the San Andres Mountains (confirmed by dissection, WBM#'s 5978 and 5983) where it has been collected on Salinas Peak by Thomas Todsens and Artie Metcalf (MALB-3145, WBM 5978) on 10 September 1972 and in Ash Canyon by Artie Metcalf (MALB-3156, WBM 5983) on 23 September 1972. Shells from Sierra Blanca Mountain (Pilsbry, 1936) and the Sierra Vieja of Texas (Cheatum, Fullington, and Pratt, 1972) may also be *S. orientis* but need to be confirmed by dissection.

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### THE COMMENSAL CLAM, *PARAMYA SUBOVATA* (*BIVALVIA: MYIDAE*) AND *THALASSEMA HARTMANI* (*ECHUROIDEA*) OFF GALVESTON, TEXAS

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Studies of macrobenthic assemblages offshore Galveston, Texas, have revealed the presence of the commensal bivalve, *Paramya subovata* (Conrad, 1845). The highest concentrations of *P. subovata* were found in May 1975 in the Bolivar Roads entrance channel (13.5 m depth) at 29° 19' 15" N. Lat. and 94° 38' 42" W. Long. A total of 242 living specimens, ranging in length from 1.5 to 6 mm, were collected at this site in five replicate spade corer samples. The average calculated abundance was 745/m<sup>2</sup>. The

specimens agree with the description in Abbott (1974, p. 537, Fig. 5989).

Jenner and McCrary (1970) reported *Paramya subovata* to be commensal specific with the echiuroid worm, *Thalassema hartmani* Fisher, 1947. *T. hartmani* has also been found during the present study. At the Bolivar Roads entrance channel site in May, a total of 261 individuals of *T. hartmani* were collected with an average calculated abundance of 805/m<sup>2</sup>. Though direct observations of the commensalistic